IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES
Docket No. 13148US02

IN THE APPLICATION OF:

Arthur J. Carlson

SERIAL NO.: 09/882,100

FILED: June 15, 2001

FOR: METHOD OF INTELLIGENTLY RESTRICTING SYMBOL SIZE IN ADSL MODEMS

ART UNIT: 2611

EXAMINER: Jason M. Perilla

Conf. No.: 7713

Electronically Filed on June 4, 2008

BRIEF ON APPEAL

Mail Stop: Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from an Office Action dated September 4, 2007, in which claims 1-22 were finally rejected.

REAL PARTY IN INTEREST

Broadcom Corporation, a corporation organized under the laws of the state of California, and having a place of business at 5300 California Avenue, Irvine, California 92617, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as set forth in the Assignment recorded at Reel 012204, Frame 0771 in the PTO assignment search room.

RELATED APPEALS AND INTERFERENCES

There currently are no appeals pending regarding related applications.

STATUS OF THE CLAIMS

Claims 1-22 are pending in the present application. Pending claims 1-22 stand rejected and are the subject of this appeal.

STATUS OF THE AMENDMENTS

None.

SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is directed to a method of restricting symbol size in an ADSL system. Pursuant to said method, during initialization, a date rate is obtained. This data rate is then compared to a threshold. If the data rate is above the threshold, symbols are formed using a multiple of a predetermined number of bits per symbol. If the data rate is below the threshold, symbols are allowed to be formed using any integer number of bits per symbol.

The invention of claim 1 is illustratively described in the Specification of the present application at, for example, page 8, line 11 – page 12, line 28, referring to Figures 4-9. For example, Figure 4 is a flowchart representing the method of claim 1. Referring to FIG. 4, block 401 shows that, during initialization, a date rate is obtained.[1] At block 403, this data rate is then compared to a threshold.[2] At block 405, if the data rate is above the threshold, symbols are formed using a multiple of a predetermined number (eight) of bits per symbol.[3] At block 407, if the data rate is below the threshold, symbols are allowed to be formed using any integer number of bits per symbol.[4] The invention of

[1] Specification, page 8, lines 12-14.
[2] Specification, page 8, lines 14-16.
[3] Specification, page 8, lines 16-17.
[4] Specification, page 8, lines 17-20.

claim 1 is also described in other parts of the application, such as in the Summary of the Invention section.

Claims 2-6 and 21 are dependent upon claim 1.

Claim 7 is also directed to a method of restricting symbol size in an ADSL system. Pursuant to the method of claim 7, a data rate is obtained during initialization. This data rate is compared to a threshold. If the data rate is above the threshold, a message to choose a symbol size that is a multiple of a predetermined number of bits per symbol is transmitted. If the data rate is below the threshold, a message without restriction as to the size of symbols is transmitted.

The invention of claim 7 is illustratively described in the Specification of the present application at, for example, page 8, line 11 – page 12, line 28, referring to Figures 4-9. For example, Figure 7 is a flowchart representing the method of claim 1. Referring to FIG. 7, block 701 shows that, during initialization, a date rate is obtained.[5] At block 703, this data rate is then compared to a threshold.[6] At block 705, if the data rate is above the threshold, a message is sent to the remote transceiver to choose a symbol size that is a multiple of a predetermined number (eight) of bits per symbol.[7] At block 707, if the data rate is below the threshold, a message without restriction as to the size of symbols is transmitted to the remote transceiver.[8] The invention of claim 7 is also described in other parts of the application, such as in the Summary of the Invention section.

Claims 8-12 and 22 are dependent upon claim 7.

Claim 13 is directed to an ADSL modem system comprising first and second modems. The first modem has a first transmitter and a first receiver. The second modem has a second transmitter and a second receiver. The second modem estimates a maximum receive data rate of the second modem and compares it to a threshold. If the maximum receive data rate is above the threshold, the second transmitter transmits a message to the first receiver that instructs the first transmitter to transmit data using a pre-selected number of bits per symbol. If the maximum receive data rate is below the threshold, the second transmitter transmits a message to the first receiver that instructs the

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[5] Specification, page 9, line 30 – page 10, line 1.
[6] Specification, page 10, lines 1-2.
[7] Specification, page 10, lines 7-9.
[8] Specification, page 10, lines 10-13.

first transmitter that it is free to transmit data using any integer number of bits per symbol.

The invention of claim 13 is illustratively described in the Specification of the present application at, for example, page 5, line 2 – page 7, line 2, referring to Figures 2 and page 8, line 11 – page 12, line 28, referring to Figures 4-9. Figure 1 is a block diagram of an ADSL modem system that may be used in connection with the present invention.[9] Referring to FIG. 1, ADSL modem system comprises first modem 111 and second modem 101.[10] The first modem 111 has a first transmitter 115 and a first receiver 114.[11] The second modem 101 has a second transmitter 105 and a second receiver 103.[12] The second modem 101 estimates a maximum receive data rate of the second modem 101 and compares it to a threshold.[13] If the maximum receive data rate is above the threshold, the second transmitter 105 transmits a message to the first receiver 114 that instructs the first transmitter 115 to transmit data using a pre-selected number of bits per symbol.[14] If the maximum receive data rate is below the threshold, the second transmitter 105 transmits a message to the first receiver 114 that instructs the first transmitter 115 that it is free to transmit data using any integer number of bits per symbol.[15]

Claims 14-20 are dependent upon claim 13.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

I. Claims 1-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bremer et al. (U.S. Patent 6,546,090) in view of Dirschedl et al. (U.S. Patent 6,262,994) and further in view of Gross et al. (U.S. Patent 6,549,520).

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[9] Specification, page 5, lines 2-3.
[10] Specification, page 5, lines 3-6.
[11] Specification, page 5, lines 10-11.
[12] Specification, page 5, lines 6-7.
[13] Specification, page 5, lines 15-23.
[14] Specification, page 10, lines 7-9.
[15] Specification, page 10, lines 10-13.

ARGUMENT

I. Claims 1-22 are not obvious under 35 U.S.C. § 103(a) in view of Bremer et al. (U.S. Patent 6,546,090) in view of Dirschedl et al. (U.S. Patent 6,262,994) and further in view of Gross et al. (U.S. Patent 6,549,520).

In the final Office Action of September 4, 2007, the Examiner rejected claims 1-22 under 35 U.S.C. § 103(a) as being unpatentable over Bremer et al. (U.S. Patent 6,546,090) in view of Dirschedl et al. (U.S. Patent 6,262,994) and further in view of Gross et al. (U.S. Patent 6,549,520).

35 U.S.C. 103(a) states:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

The Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), laid out the standard of patentability to be applied in obviousness rejections, stating:

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art references.[16]

[16] *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

A. Claims 1-12, 21 and 22 are not obvious under 35 U.S.C. § 103(a) in view of Bremer, Dirschedl and Gross.

Claim 1 is directed to:

> 1. A method of restricting symbol size in an ADSL system comprising:
> obtaining a data rate during initialization;
> comparing the data rate to a threshold;
> forming symbols using a multiple of a predetermined number of bits per symbol if the data rate is above the threshold; and
> allowing symbols to be formed using any integer number of bits per symbol if the data rate is below the threshold.

Thus claim 1 includes steps of "obtaining a data rate during initialization" and "comparing the data rate to a threshold." On page 5 of the final Office Action (dated September 14, 2007), the Examiner asserts that Dirschedl teaches obtaining information regarding the data rate during initialization at col. 2, line 63 – col. 3, line 9, which talks about determining an error rate. However, the relevant limitation of claim 1 reads, "obtaining a data rate." An error rate is not a data rate. Therefore, claim 1 distinguishes over the cited art.

On page 6 (1st full paragraph) of the Office Action, the Examiner acknowledges that Dirschedl does not teach "obtaining a data rate," but goes on to make the incredibly strained argument that an error rate is the known functional equivalent to a data rate. Appellant vigorously disputes this assertion. In transmission systems, error rate indicates the number of erroneous bits per number of bits transmitted, whereas data rate indicates the number of bits transmitted in a given time. These are in no way functionally equivalent. To support his argument that an error rate is the known functional equivalent to a data rate, the Examiner cites col. 4, lines 29-33, of Gross,[17] which reads, "Preferably, this is the maximum data rate that can be provided for the particular communications subchannel, subject to predefined constraints such as maximum bit error rate, maximum signal power, etc. that may be imposed by other considerations." Appellant submits that the cited excerpt from Gross in no way supports the Examiner's contention that an error

[17] Final Office Action, September 4, 2007, page 6, lines 6-10.

rate is the known functional equivalent to a data rate. At best, this excerpt from Gross is saying that an error rate can have an effect on the maximum data rate that can be achieved in a system, which is certainly not equivalent to saying that a data rate and an error rate are equivalent, as stated by the Examiner. The Examiner further contends that col. 4, lines 29-33, of Gross suggest "to substitute information regarding a data rate (i.e. error rate) with a data rate."[18] To the extent that this assertion makes any sense, the assertion is patently false and a gross mischaracterization of the cited excerpt from Gross. The Examiner further supports his argument by alleging a parallel between error rate and maximum receive data rate.[19] However, claim 1 does not refer to a "maximum receive data rate," but instead simply to the "data rate." Furthermore, an error rate is not the same thing as a maximum receive data rate.

On page 3 of the final Office action, the Examiner tries to support his contention that an error rate is the functional equivalent of a data rate by arguing that the determination of an error rate necessitates the determination of a data rate, based on the Examiner's assertion that an error rate equals *errors per unit data*.[20] The Examiner fails to mention, or fails to realize, that an error rate can also (and, in fact, more often is) defined as *errors per unit time*. In such a case, determination of an error rate does not necessitate the determination of a data rate.

As explained above, the examiner goes to great lengths to make the argument that an error rate is the functional equivalent of a data rate, and therefore Dirschedl teaches "obtaining a data rate" per claim 1. But claim 1 does not call for just obtaining a data rate. It calls for obtaining a data rate, comparing it to a threshold, and taking specific actions based on the comparison of the data rate to the threshold. Even assuming, *arguendo*, that Dirschedl's obtaining of an error rate is equivalent to obtaining a data rate (and it most certainly is not), Dirschedl certainly does not teach comparing a data rate to a threshold and taking the specific actions of claim 1 based on the comparison of the data rate to the threshold. So even if the determination of an error rate necessitates the determination of a data rate, as asserted by the Examiner, that fact is irrelevant, because

[18] Final Office Action, September 4, 2007, page 6, lines 6-10.
[19] Final Office Action, September 4, 2007, page 6, lines 9-10.
[20] Final Office Action, September 4, 2007, page 3, lines 6-8.

Dirschedl does not teach making decisions based on the data rate, let alone doing so in the manner set forth in claim 1.

On page 5 of the final Office Action, the Examiner asserts that Dirschedl teaches "forming symbols (i.e., 1, 2, or 3 bits using 2, 4, and 8 PSK) using a multiple of a predetermined number (i.e. 1) of bits if the information is above the threshold (col. 2, line 45); and allowing symbols to be formed using an integer number of bits per symbol if the information is below the threshold (col. 2, line 45)." Appellant points out that the examiner misstates the wording of claim 1 here. Claim 1 states in relevant part, "allowing symbols to be formed using *any* integer number of bits per symbol if the data rate is below the threshold." Dirschedl fails to teach allowing symbols to be formed using *any* integer number of bits per symbol if the data rate (or the error rate, per the Examiner's faulty construction) is below the threshold. Rather, in the scheme of Dirschedl, based on the comparison of the error rate to a threshold, a specific predetermined number of bits per symbol is used. That is, based on the comparison of the error rate to a threshold, either 2PSK (1 bit per symbol), 4 PSK (2 bits per symbol) or 8PSK (3 bits per symbol) is used.[21] Contrast this with an embodiment of the present invention where, if the data rate is above the threshold, symbols are formed using a multiple of eight bits per symbol, whereas if the data rate is below the threshold, symbols are allowed to be formed using *any* integer number of bits (for example 1 bit, 2 bits, 3 bits, 4 bits, 5 bits, 7 bits, 10 bits, etc.).[22] Because Dirschedl teaches using a specific predetermined number of bits per symbol if the error rate is below the threshold, it cannot be said that Dirschedl allows symbols to be formed using *any* integer number of bits per symbol if the data rate (or error rate) is below the threshold. This is another way in which claim 1 distinguishes from Dirschedl and the other cited art.

Claim 1 also specifies that the data rate upon which the operations of the claim are based is obtained during initialization. This is yet another limitation that distinguishes claim 1 over the methods of Dirschedl. Dirschedl nowhere refers to performing its methods during the initialization stage. All indications are that the methods are Dirschedl are performed dynamically during normal operation of the device. Col. 3, lines 9-12, of Dirschedl states, "Given the setup of the connection, averages of the

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[21] Dirschedl, U.S. Patent 6,262,994, col. 2, lines 41-49.
[22] See Specification, Figures 4 and 7 and supporting text.

setting variables, which can be selected, are first set, for example, to a medium size of packet, the type of modulation 8PSK, a FEC code arte of ½, and the highest transmitter power." Thus the variables in Dirschedl are initially set at predetermined values, rather than determined based on the error rate determination. The paragraph at col. 3, lines 13-25, indicates that after these initial settings are set at the predetermined values, the variables are adjusted automatically based on the error rate determination during normal operation of the device. On page 4 of the final Office Action, the Examiner responds to this argument by saying, "Dirschedl does not limit its use to some point in time much later than a power on time. That is, the invention of the prior art could reasonably be expected to determine data rate upon the first instance of data transmission or an *initialization period.*" But initialization is a term of art that is understood by those in the art. One of skill in the art would know that the initialization period occurs *before* the first instance of data transmission. What's more, Dirschedl explains how its setting variables are initialized,[23] and it is not as set forth in claim 1. This is yet another aspect of claim 1 that distinguishes over the cited art.

For at least the above reasons, Appellant submits that claim 1, and claims 2-6 and 21 depending therefrom, are allowable over the cited art.

Claim 7 includes limitations similar to those included in claim 1. Appellant submits that claim 7, and claims 8-12 and 22 depending therefrom, are allowable over the cited art for the reasons set forth above with respect to claim 1.

[23] Dirschedl, U.S. Patent 6,262,994, col. 3, lines 9-12.

B. *Claims 13-20 are not obvious under 35 U.S.C. § 103(a) in view of Bremer, Dirschedl and Gross.*

Claim 13 is directed to

> 13. An ADSL modem system comprising:
>
> a first modem having a first transmitter and a first receiver; and
>
> a second modem having a second transmitter and a second receiver, the second modem operable to estimate a maximum receive data rate of the second modem and compare it to a threshold, the second transmitter transmitting a message to the first receiver that instructs the first transmitter to transmit data using a pre-selected number of bits per symbol if the maximum receive data rate is above the threshold, the second transmitter transmitting a message to the first receiver that instructs the first transmitter that it is free to transmit data using any integer number of bits per symbol if the maximum receive data rate is below the threshold.

The Examiner acknowledges on page 8 of the final Office Action that Bremer in view of Dirschedl fails to teach a modem that estimates a maximum receive data rate per claim 13. The Examiner argues Dirschedl teaches a modem that estimates an error rate and argues that an error rate is an art accepted equivalent to a maximum achievable data rate, citing the excerpt of Gross as applied to claim 1 above.[24] Appellant disputes the Examiner's assertion that an error rate is an art accepted equivalent to a maximum receive data rate. To support his argument, the Examiner cites col. 4, lines 29-33, of Gross,[25] which reads, "Preferably, this is the maximum data rate that can be provided for the particular communications subchannel, subject to predefined constraints such as maximum bit error rate, maximum signal power, etc. that may be imposed by other considerations." Appellant submits that the cited excerpt from Gross in no way supports the Examiner's contention that an error rate is the known functional equivalent to a maximum receive data rate. At best, this excerpt from Gross is saying that an error rate can have an effect on the maximum data rate that can be achieved in a system, and that is certainly not equivalent to saying that a maximum receive data rate and an error rate are

[24] Final Office Action, September 4, 2007, page 8, lines 13-14.
[25] Final Office Action, September 4, 2007, page 6, lines 6-10.

equivalent. On page 6 of the Office Action, the Examiner further contends that col. 4, lines 29-33, of Gross suggest "to substitute information regarding a data rate (i.e. error rate) with a data rate."[26] To the extent that this assertion makes any sense, the assertion is patently false and a gross mischaracterization of the cited excerpt from Gross.

On page 3 of the final Office action, the Examiner tries to support his contention that an error rate is the functional equivalent of a data rate by arguing that the determination of an error rate necessitates the determination of a data rate, based on the Examiner's assertion that an error rate equals *errors per unit data.*[27] The Examiner fails to mention, or fails to realize, that an error rate can also (and, in fact, more often is) defined as *errors per unit time.* In such a case, determination of an error rate does not necessitate the determination of a data rate.

As explained above, the examiner goes to great lengths to make the argument that an error rate is the functional equivalent of a data rate, and therefore Dirschedl teaches a "second modem operable to estimate a maximum receive data rate of the second modem" per claim 13. But claim 13 does not call for just obtaining a data rate. It calls for estimating a maximum receive data rate, comparing it to a threshold, and taking specific actions based on the comparison of the maximum receive data rate to the threshold. Even assuming, *arguendo*, that Dirschedl's obtaining of an error rate is equivalent to obtaining a maximum receive data rate (and it most certainly is not), Dirschedl certainly does not teach comparing a maximum receive data rate to a threshold and taking the specific actions of claim 13 based on the comparison of the maximum receive data rate to the threshold. So even if the determination of an error rate necessitates the determination of a data rate, as asserted by the Examiner, that fact is irrelevant, because Dirschedl does not teach making decisions based on the maximum receive data rate, let alone doing so in the manner set forth in claim 13.

On page 7 of the final Office Action, the Examiner asserts that Dirschedl teaches "according the success/fail determination, the number of bits per symbol is updated according to a pre-selected number of bits per symbol (i.e., 1, 2, or 3) or an integer number of bits per symbol (i.e., 1, 2 or 4) as applied to claim 1." Appellant submits that Dirschedl fails to teach transmitting a message to the first receiver that instructs the first

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[26] Final Office Action, September 4, 2007, page 6, lines 6-10.
[27] Final Office Action, September 4, 2007, page 3, lines 6-8.

transmitter that it is free to transmit data using any integer number of bits per symbol if the maximum receive data rate (or the error rate, per the Examiner's faulty construction) is below the threshold, per claim 13. Rather, in the scheme of Dirschedl, based on the comparison of the error rate to a threshold, a specific predetermined number of bits per symbol is used. That is, based on the comparison of the error rate to a threshold, either 2PSK (1 bit per symbol), 4 PSK (2 bits per symbol) or 8PSK (3 bits per symbol) is used.[28] Contrast this with an embodiment of the present invention where, if the data rate is above the threshold, symbols are formed using a multiple of eight bits per symbol, whereas if the data rate is below the threshold, symbols are allowed to be formed using *any* integer number of bits (for example 1 bit, 2 bits, 3 bits, 4 bits, 5 bits, 7 bits, 10 bits, etc.).[29] Because Dirschedl teaches using a specific predetermined number of bits per symbol if the error rate is below the threshold, it cannot be said that Dirschedl teaches transmitting a message to the first receiver that instructs the first transmitter that it is free to transmit data using any integer number of bits per symbol if the maximum receive data rate (or the error rate) is below the threshold, per claim 13. This is another way in which claim 13 distinguishes from Dirschedl and the other cited art.

For at least the above reasons, Appellant submits that claim 13, and claims 14-20 depending therefrom, are allowable over the cited art.

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[28] Dirschedl, U.S. Patent 6,262,994, col. 2, lines 41-49.

[29] See Specification, Figures 4 and 7 and supporting text.

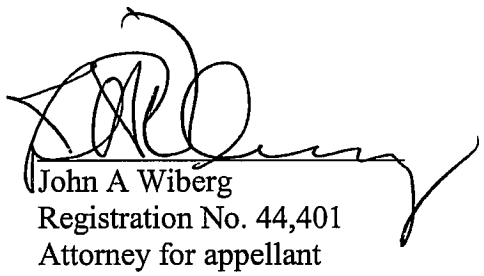
II. Conclusion

For at least the foregoing reasons, Appellant submits that claims 1-22 are allowable over the cited art. Reversal of the Examiner's rejection and issuance of a patent on the application are therefore requested.

The Commissioner is hereby authorized to charge $510 (to cover the Brief on Appeal Fee of $510) and any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Account No. 13-0017.

Dated: June 4, 2008

Respectfully submitted,



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APPENDIX

(37 C.F.R. § 1.192(c)(9))

The following claims are involved in this appeal:

1. A method of restricting symbol size in an ADSL system comprising:

obtaining a data rate during initialization;

comparing the data rate to a threshold;

forming symbols using a multiple of a predetermined number of bits per symbol if the data rate is above the threshold; and

allowing symbols to be formed using any integer number of bits per symbol if the data rate is below the threshold.

2. The method of claim 1 wherein the data rate is obtained from a remote location.

3. The method of claim 1 wherein the data rate comprises an estimated maximum receive data rate.

4. The method of claim 1 wherein the threshold is one of approximately 1 Mbits per second or approximately 250 Kbits per second, and wherein the symbols are transmitted using a multiple of 8 bits per symbol if the data rate is above the threshold.

5. The method of claim 1 wherein the threshold is one of approximately 2 Mbits per second or approximately 500 Kbits per second, and wherein the symbols are transmitted using a multiple of 4 bits per symbol if the data rate is above the threshold.

6. The method of claim 1 wherein the threshold is one of approximately 3 Mbits per second or approximately 750 Kbits per second, and wherein the symbols are transmitted using a multiple of 2 bits per symbol if the data rate is above the threshold.

7. A method of restricting symbol size in an ADSL system comprising:

obtaining a data rate during initialization;

comparing the data rate to a threshold;

transmitting a message to choose a symbol size that is a multiple of a predetermined number of bits per symbol if the data rate is above the threshold; and

transmitting a message without restriction as to the size of symbols if the data rate is below the threshold.

8. The method of claim 7 wherein the data rate is obtained from a remote location.

9. The method of claim 7 wherein the data rate comprises an estimated maximum receive data rate.

10. The method of claim 7 wherein the threshold is one of approximately 1 Mbits per second or approximately 250 Kbits per second, and wherein the message is transmitted to choose a symbol size that is a multiple of 8 if the data rate is above the threshold.

11. The method of claim 7 wherein the threshold is one of approximately 2 Mbits per second or approximately 500 Kbits per second, and wherein the message is transmitted to choose a symbol size that is a multiple of 4 if the data rate is above the threshold.

12. The method of claim 7 wherein the threshold is one of approximately 3 Mbits per second or approximately 750 Kbits per second, and wherein the message is transmitted to choose a symbol size that is a multiple of 2 if the data rate is above the threshold.

13. An ADSL modem system comprising:

a first modem having a first transmitter and a first receiver; and

a second modem having a second transmitter and a second receiver, the second modem operable to estimate a maximum receive data rate of the second modem

and compare it to a threshold, the second transmitter transmitting a message to the first receiver that instructs the first transmitter to transmit data using a pre-selected number of bits per symbol if the maximum receive data rate is above the threshold, the second transmitter transmitting a message to the first receiver that instructs the first transmitter that it is free to transmit data using any integer number of bits per symbol if the maximum receive data rate is below the threshold.

14. The ADSL modem system of claim 13 wherein the pre-selected number of bits per symbol is one of a multiple of 8, 4 or 2.

15. The ADSL modem system of claim 14 wherein the threshold is one of approximately 1 Mbits per second or approximately 250 Kbits per second, and wherein the pre-selected number of bits per symbol is 8 if the maximum receive data rate is above the threshold.

16. The ADSL modem system of claim 14 wherein the threshold is one of approximately 2 Mbits per second or approximately 500 Kbits per second, and wherein the pre-selected number of bits per symbol is 4 if the maximum receive data rate is above the threshold.

17. The ADSL modem system of claim 14 wherein the threshold is one of approximately 3 Mbits per second or approximately 750 Kbits per second, and wherein the pre-selected number of bits per symbol is 2 if the maximum receive data rate is above the threshold.

18. The ADSL modem system of claim 14 wherein the second receiver receives a training signal that is used to estimate the maximum receive data rate of the first modem.

19. The ADSL modem system of claim 14 wherein the second modem further has a manager that estimates the maximum receive data rate of the first modem and compares the estimated maximum receive data rate to the threshold.

20. The ADSL modem of claim 14 wherein the first modem further has a manger that configures the first transmitter to transmit data using the pre-selected number of bits per symbol if the maximum receive data rate is above the threshold and that allows the first transmitter to transmit data using any interval number of bits per symbol if the maximum receive data rate is below the threshold.

21. The method of claim 1 wherein the predetermined number is one of 8, 4 and 2.

22. The method of claim 7 wherein the predetermined number is one of 8, 4 and 2.

EVIDENCE APPENDIX

Not applicable.

RELATED PROCEEDINGS APPENDIX

The Appellant is unaware of any related appeals or interferences.